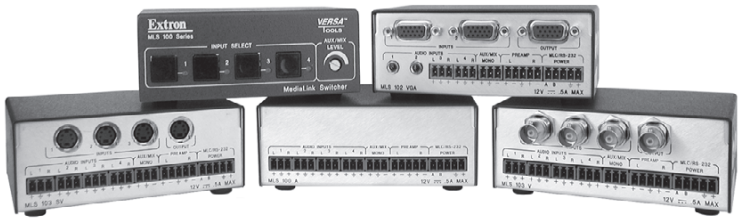
Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual



MLS 100 A, MLS 102 VGA, MLS 103 V, MLS 103 SV

MediaLink™ VersaTools® Switchers

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Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterias usadas siguiendo las instrucciones del fabricante.

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Daisan DMJ Bldg. 6F,
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Quick Start Guide — MLS 100 Series

To install and set up the MLS 100 Series switchers, follow these steps and see the appropriate section of this manual for details:

Step 1

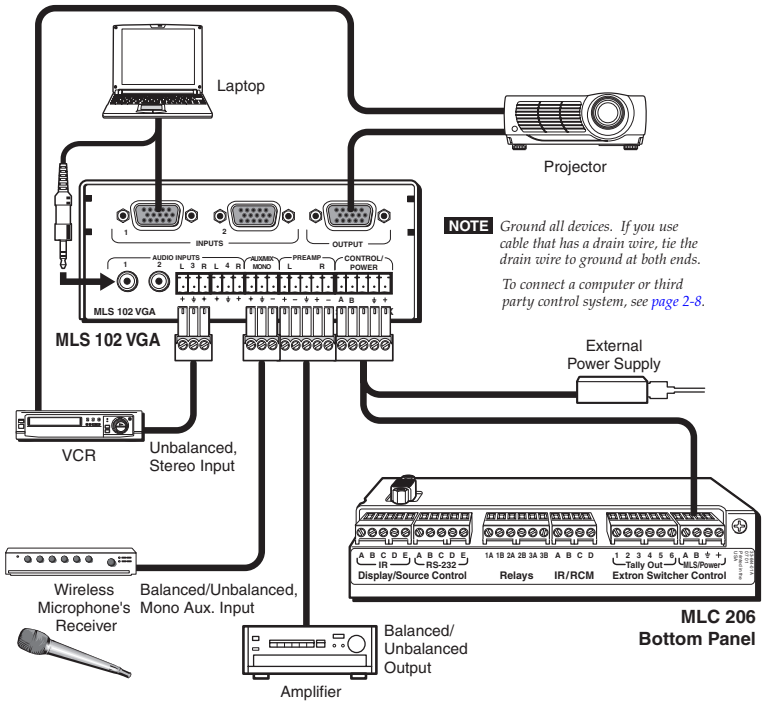
Turn all of the equipment off and **disconnect the power cords**.

Step 2

Mount the switcher (if applicable) or affix the rubber feet to the bottom of the switcher for tabletop use. See page 2-2.

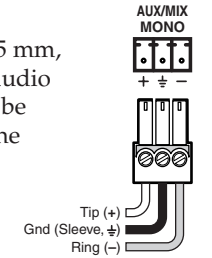
Step 3

Attach the cables. See the instructions beginning on page 2-5.



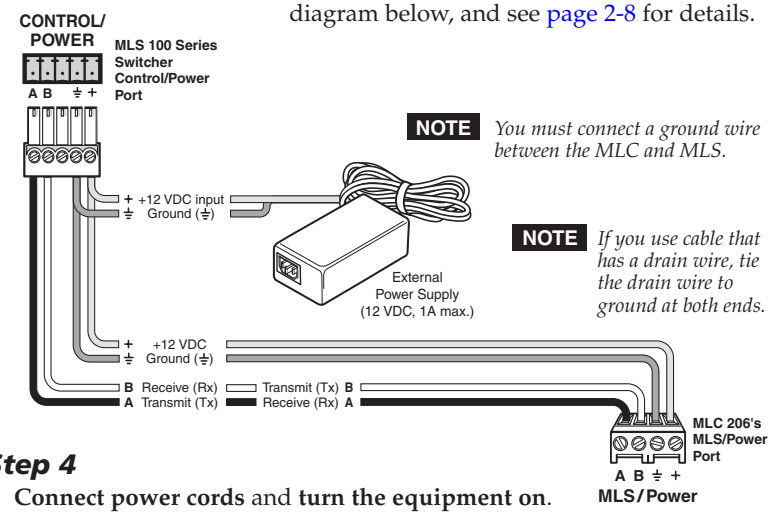
For the **Aux/Mix Mono** audio input, connect a 3.5 mm, 3-pole captive screw connector to one end of an audio cable as shown at right. This line level input can be balanced or unbalanced. Wire the other end to one tip-ring-sleeve connector.

NOTE *The u Mix level **must be adjusted** (- d to 2 d) **via the front panel control**. It cannot be adjusted via software.*



Aux/Mix Input Wiring
(balanced/unbalanced, mono)

To connect an MLC 206 or a third party control system, see the diagram below, and see page 2-8 for details.

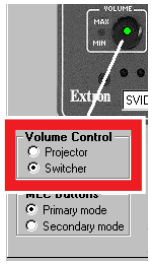

CONTROL/ POWER
MLS 100 Series Switcher Control/Power Port
A B ⏚ +
NOTE
You must connect a ground wire between the MLC and MLS.
+ +12 VDC input
⏚ Ground (⏚)
External Power Supply (12 VDC, 1A max.)
NOTE
If you use cable that has a drain wire, tie the drain wire to ground at both ends.
+ +12 VDC
⏚ Ground (⏚)
B Receive (Rx)
A Transmit (Tx)
Transmit (Tx) B
Receive (Rx) A
MLC 206's MLS/Power Port
A B ⏚ +
MLS/Power

Step 4

Connect power cords and **turn the equipment on**.

Step 5

Test the system: select an input from the front panel buttons or via the control software; observe the display and listen to the audio output. If you use the MediaLink Control Software, set the volume control in the *Controller MLC Config* section to "Switcher", as shown at right. Make any needed cabling corrections.



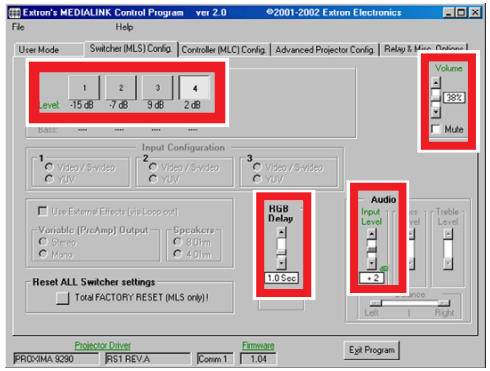
WARNING *To avoid damage to your hearing, the Aux/Mix input and the selectable audio inputs' levels and output volume should be set as low as possible before you test the sound system.*

Step 6

Adjust the Aux/Mix level: turn the front panel potentiometer while listening to the audio output. See page 3-3.

Step 7

Set up the switcher. In the *Switcher MLS Config* part of the MediaLink Control Software, set the per-input audio adjustments, RGB delay period (MLS 102 VGA), and the output volume. See pages 4-8 to 4-10.



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68-652-01 **Rev. B**
Printed in the USA
08 04

Chapter One

Introduction

About this Manual

About the MLS 100 Series Switchers

Features

About this Manual

This manual contains information about the Extron MLS 100 Series Switchers (MLS 100 A, MLS 103 V, MLS 103 SV, MLS 102 VGA) and on how to install, set up, and operate them. "MLS 100 Series switcher", "MLS", and "switcher" will be used interchangeably in this manual.

About the MLS 100 Series Switchers

The Extron MLS 100 Series Switchers are compact, quarter rack width switchers. The MLS 102 VGA, MLS 103 SV, and MLS 103 V have a 250 MHz (-3 dB) video bandwidth. The MLS 102 VGA, MLS 103 SV, and MLS 103 V provide a way to switch up to three video input signals (up to two for the VGA model) to one output.

All models (MLS 102 VGA, MLS 103 SV, MLS 103 V, MLS 100 A) feature four selectable audio inputs, and also one Aux/Mix input that is always active and can be mixed with any and all of the four selectable audio inputs.

Front panel buttons, an RS-232-based control system, or an Extron MediaLink™ Controller (MLC) can be used for input selection.

Features

Furniture, rack, and projector mountability — MLS 100 Series Switchers can be mounted under a desk or other furniture, or mounted on a projector lift with optional brackets. Alternatively, they can be rack mounted on an optional rack shelf.

Stereo audio input and output — Unbalanced stereo audio inputs can be output as balanced or unbalanced stereo audio, and the audio output level can be adjusted.

Mono auxiliary/mix audio input— The Aux/Mix port on each switcher lets you mix a mono, line level audio input signal with that of one of the four selectable stereo audio inputs.

Chapter Two

Installation

UL/Safety Requirements

Mounting the Switchers

Rear Panel Features and Cabling

Setting Up Optimal Audio Gain

Application Diagrams

UL/Safety Requirements

The Underwriters Laboratories (UL) requirements listed below pertain to the safe installation and operation of the switcher.

1. This unit is not to be connected to a centralized DC power source o r used beyond its rated voltage range.

NOTE *The tron S and other tron power supplies may be used with the MLS.*

2. Do *not* use the switcher near water.

WARNING *To reduce the risk of fire or electric shoc , do not e pose this apparatus to rain or moisture.*

3. Clean the switcher only with a dry cloth.
4. Do not install the switcher near any heat source, such as a radiator, heat register, stove, or another apparatus (including amplifiers) that produces heat.
5. Unplug the switcher during lightning storms or when it will be unused for long periods.
6. This unit must be installed in accordance with the National Electrical Code.

Mounting the Switchers

The one rack unit high, quarter rack width switchers can be set on a table, or mounted on a rack shelf, mounted under a desk or tabletop, or mounted on a projector bracket.

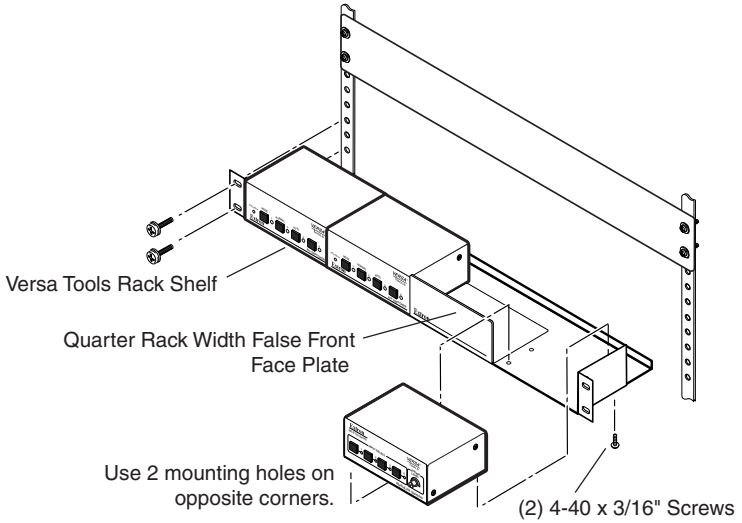
Tabletop use

Each MLS switcher comes with rubber feet. For tabletop use, attach a self-adhesive rubber foot to each corner of the bottom of the unit.

Rack mounting

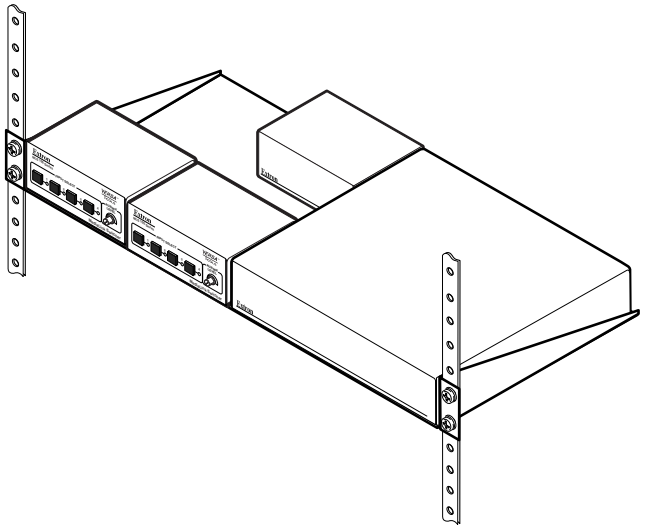
For optional rack mounting, do not install the rubber feet. Mount the MLS on a VersaTools® 19" 1U Rack Shelf (Extron part #60-190-20) or a standard Universal 1U Rack Shelf (Extron part #60-190-01). On the standard rack shelf, the MLS mounts in one of four locations to the rear of the rack or in one of four locations to the front of the rack.

1. If rubber feet were previously installed on the bottom of the MLS, remove them.
2. Mount the MLS on the rack shelf, using two 4-40 x 1/8 screws in opposite (diagonal) corners to secure the MLS switcher to the shelf.


Versa Tools Rack Shelf
Quarter Rack Width False Front Face Plate
Use 2 mounting holes on opposite corners.
(2) 4-40 x 3/16" Screws

Mounting the MLS on a VersaTools rack shelf

NOTE *Only products in the VersaTools line can be mounted to a VersaTools shelf. Most 1U rack-mountable Extron products can be mounted on the standard shelf.*



Mounting the MLS on a 1U standard rack shelf

3. Install blank panel(s) or other unit(s) to the rack shelf.

Furniture or projector mounting

Furniture mount or projector mount the MLS using the optional mounting kit (part #70-212-01, furniture; or 70-217-01, projector) as follows:

1. Attach the mounting brackets to the MLS with the machine screws provided.

2. If feet were previously installed on the bottom of the MLS, remove them.

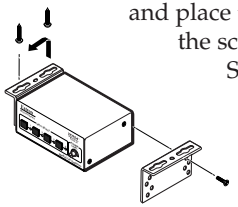
For furniture mounting

3a. Hold the MLS with the attached brackets against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.

4a. Drill 3/32" (2 mm) diameter pilot holes, 1/4" (6.3 mm) deep in the mounting surface at the marked screw locations.

5a. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" of the screw protrudes.

6a. Align the mounting screws with the slots in the brackets and place the MLS against the surface, with the screws through the bracket slots. See the illustration at left.

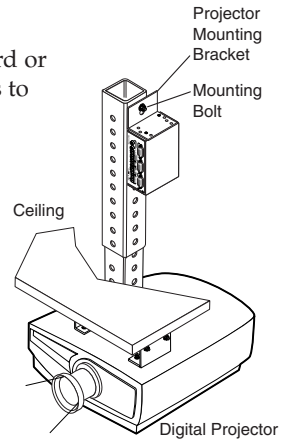


Mounting the MLS to furniture

7a. Slide the switcher slightly forward or back, then tighten all four screws to secure the MLS in place.

For projector mounting

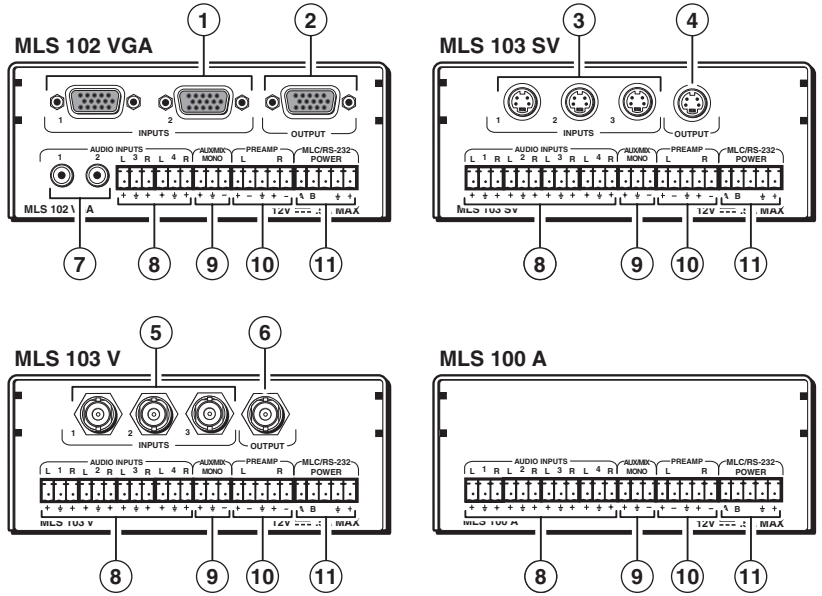
3b. Secure the MLS to a projector mount or other surface by inserting the mounting bolt through the bracket's slotted hole, as shown at right.



Mounting the MLS to a projector mount

Rear Panel Features and Cabling

Turn off and disconnect power from all the equipment before you connect cables to the MLS.



Video connections

(1) **Computer video inputs (MLS 102 VGA only)** — Cable one or two VGA-UXGA computers to these individually buffered 15-pin HD connectors. These inputs provide ID bit termination.

(2) **Computer video output (MLS 102 VGA only)** — Connect a cable from this 15-pin HD connector to the input port of the projector or display.

(3) **S-video inputs (MLS 103 SV only)** — Cable up to three S-video sources to the MLS via these female 4-pin mini DIN connectors.

(4) **S-video output (MLS 103 SV only)** — Connect the S-video input port of the projector or display to the MLS by plugging S-video cables into these female 4-pin mini DIN connectors.

(5) **Composite video inputs (MLS 103 V only)** — Connect up to three composite video input sources to the MLS 103 V using coaxial cables and these female BNCs.

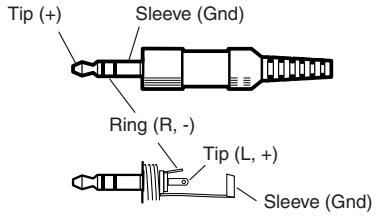
(6) **Composite video output (MLS 103 V only)** — Attach a coaxial cable to this female BNC, and connect the other end of the cable to the projector's or display's video input port.

Audio connections

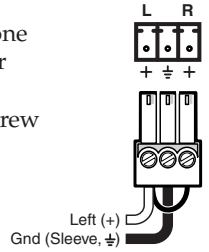
The stereo audio inputs 1–3 (⑦ and ⑧ on page 2-5 and below) correspond to video inputs 1, 2, and 3. All four audio inputs can be selected via the front panel buttons, RS-232 control (including MLC), or the MediaLink Control Software. An audio signal from one of these inputs is output only when the corresponding input is selected. Using the MediaLink Control Software you can separately adjust the level of each of these audio inputs.

Via RS-232 control audio input signals can also be switched separately from the video signals (a feature called "audio breakaway"). See pages 4-4 and 4-8.

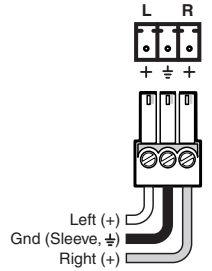
⑦ **Computer audio inputs (MLS 102 VGA only)** — These inputs each accept unbalanced stereo audio input via a 3.5 mm stereo mini receptacle (tip-ring-sleeve type). If you do not have a pre-terminated audio cable, wire the mini jack on each end of the cable as shown at left.



⑧ **Audio Inputs (all models)** — Each of these 3-pole 3.5 mm captive screw connectors accepts one unbalanced stereo or mono audio input. Wire each captive screw connector as shown at right, depending on the input type.

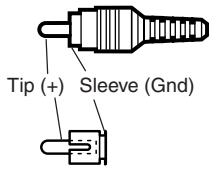


Audio Input Wiring
(unbalanced, mono)



Audio Input Wiring
(unbalanced, stereo)

Connect two RCA-style (tip-ring) connectors to the other end of each audio input cable as shown at right:

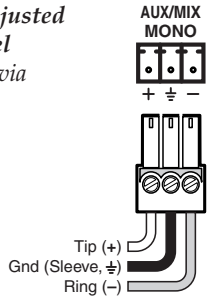


⑨ **Aux/Mix Mono audio input (all models)** —The Aux/Mix Mono audio channel is always active: its signal is output no matter which, if any, other audio input (input 1, 2, 3, or 4) is selected. For example, you could connect the output of a wireless microphone receiver to this port so the presenter's comments can always be heard and are independent of the A/V source used for the presentation.

The mix output level can be adjusted between -43 dB and +24 dB.

NOTE *The Aux/Mix level **must be adjusted physically via the front panel control**. It <u>cannot</u> be adjusted via software.*

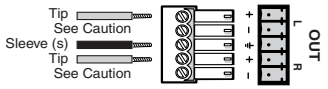
Connect a 3.5 mm, 3-pole captive screw connector to one end of an audio cable as shown at right. Wire the other end to two tip-ring connectors or one tip-ring-sleeve connector as shown in ⑦ and ⑧, and connect it between the MLS 100 Series switcher and the auxiliary audio source.



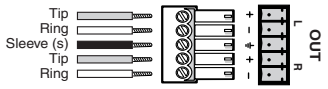
Aux/Mix Input Wiring
(balanced/unbalanced, mono)

⑩ **Audio output (Preamp) (all models)** — Connect self-powered speakers or another stereo audio device to the MLS via this 5-pole 3.5 mm captive screw connector. Depending on how the connector is wired, the audio output can be balanced or unbalanced stereo audio. Wire the connector as shown below.

Unbalanced Output



Balanced Output



CAUTION *Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.*

Later, after all the equipment has been cabled and powered on, use the MediaLink Control Program or an **RS-232** controller to set the per-input gain/attenuation to match the correct audio output level for the kind of output (balanced or unbalanced) you need. See pages 2-9 and 4-10 for details on determining and setting the gain/attenuation to produce the desired output levels.

NOTE *If you wire an audio output for balanced output, the MLS will output a unity signal (input level = output level). Wiring an audio output for unbalanced output causes the audio signal to be attenuated by 6 dB. See pages 2-9 and 2-10 for instructions on adjusting audio gain.*

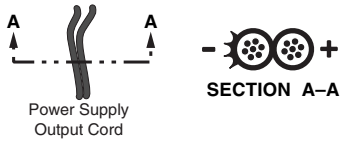
NOTE *Overall volume control ranges from 0% (90 dB attenuation) to 100% (0 dB attenuation). Adjustment increments are 1 dB for steps from 1% to 40% volume. Adjustments are in 0.5 dB increments from 41% to 100% of full volume.*

Control and power connections

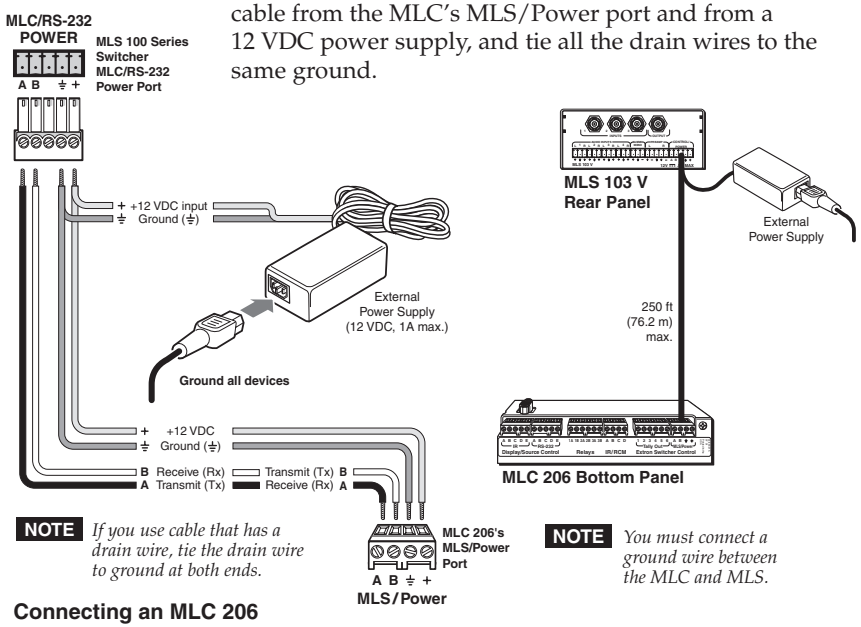
(11) **MLC/RS-232 Power port (all models)** — An Extron MediaLink Controller (MLC 206), a computer, or an RS-232 controller provides remote control of input switching and volume, and also provides a way to set the switcher's audio input levels. To control and/or set up the MLS, connect a cable between this 5-pole, 3.5 mm captive screw connector and an optional MLC 206, computer, or a RS-232 controller. Also connect an external 12 VDC power supply here to provide power to the MLS and to the optional MLC.

Extron Comm-Link cable is recommended for this connection. If using Comm-Link cable, the switcher and controller can be up to 250 feet (76.2 m) apart. Wire the captive screw connector for connection to an MLC 206 or third party controller as shown below.

- For a **stand-alone MLS switcher**, connect a cable from the host computer or a control system to this connector to set up and remotely control the switcher, connect a 12 VDC power supply, and tie all the drain wires to the same ground.



- For an **MLS switcher slaved to an MLC controller**, connect a cable from the MLC's MLS/Power port and from a 12 VDC power supply, and tie all the drain wires to the same ground.



NOTE *If you use cable that has a drain wire, tie the drain wire to ground at both ends.*

NOTE *You must connect a ground wire between the MLC and MLS.*

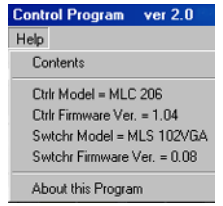
Connecting an MLC 206 to a MediaLink VersaTools Switcher and an external power supply

Once the system has been cabled and set up via the control software and the front panel Aux/Mix adjustment, the MLC or a host computer communicating through the MLC can be used to remotely control the switcher. Refer to chapter four of the *MediaLink Controllers User's Manual* and to the MediaLink Control Program help file for details on configuring an MLC-MLS system.

NOTE *An Extron IR Link infrared repeater cannot be used with the MLS 100 Series switchers. There is no connection for that device's control signals.*

NOTE *The MLC to which the MLS 100 Series switcher is connected **must** have **MLC firmware version 1.04 or higher**. The **control/setup software must be version 2.0 or higher**. Use one of the following methods to find out the version levels of the MLC's firmware and the control software.*

- *Connect the MLC's RS-232 port to a computer or RS-232 controller, and send an SIS command (see chapter four) of Q to the MLC. The MLC will respond with its firmware version.*
- *Connect the MLC's RS-232 port to a computer, start the MediaLink control software (see chapter four), and click on* Help *to display the software version, the MLC's firmware version, and the MLS's firmware version as shown in the example at right.*



If your MLS's firmware is an earlier version, contact Extron to obtain updated firmware.

Setting Up Optimal Audio Gain

Audio input levels and desired output levels vary depending on the types of equipment involved. Before setting the MLS's per-input gain or attenuation, determine the levels of the input and output equipment. Use the table below as a general guide.

Typical Audio Levels for Various Equipment Types		Input/Output Levels			
		+4 dBu	0 dBu	-10 dBV (-8 dBu)	-20 dBV (-18 dBu)
Equipment Categories	Professional line level audio equipment	X	X		
	Consumer audio equipment (VCRs, DVDs, laptop computers, portable audio devices)			X	X

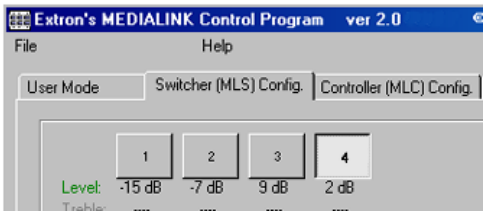
Gain and attenuation are adjustable (from -18 dB to +24 dB) for each input (1 through 4) via RS-232 control only (using

HyperTerminal, a third party controller, or the MediaLink Control/Configuration Software). The gain and attenuation for the Aux/Mix input are adjustable only via the switcher's front panel. (See page 3-3 for Aux/Mix details.)

Setup via the MediaLink™ Control Software

WARNING *To avoid damage to your hearing, the output volume should be set as low as possible before you test the sound system.*

1. Cable and power on all the equipment.
2. Start the MediaLink Control Software (see page 4-7), and select the *Switcher (MLS) Config* portion of the program (the second tab from the left).
3. Select an audio input. See the picture below for an example.



4. Use the following table to determine the gain or attenuation. Match the desired level for balanced output or for unbalanced output, depending on how the output connector is wired.

Gain and Attenuation Settings for MLS 100 Series Switchers

		Desired Output Levels							
		Balanced				Unbalanced			
		+4 dBu	0 dBu	-10 dBV (-8 dBu)	-20 dBV (-18 dBu)	+4 dBu	0 dBu	-10 dBV (-8 dBu)	-20 dBV (-18 dBu)
Input Source Levels	+4 dBu	0 dB	-4 dB	-12 dB	-22 dB	+6 dB	+2 dB	-6 dB	-16 dB
	0 dBu	+4 dB	0 dB	-8 dB	-18 dB	+10 dB	+6 dB	-2 dB	-12 dB
	-10 dBV (-8 dBu)	+12 dB	+8 dB	0 dB	-10 dB	+18 dB	+14 dB	+6 dB	-4 dB
	-20 dBV (-18 dBu)	+22 dB	+18 dB	10 dB	0 dB	n.a.	+24 dB	+16 dB	+6 dB

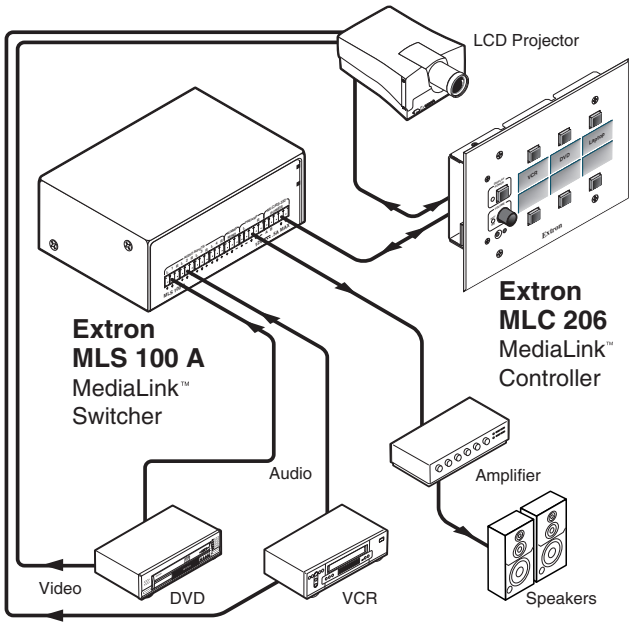
NOTE *If you wire an audio output for balanced output, the MLS will output a unity signal (input level = output level). If you wire an audio output for unbalanced output, it causes the audio signal to be attenuated by 6 dB (gain = -6 dB).*

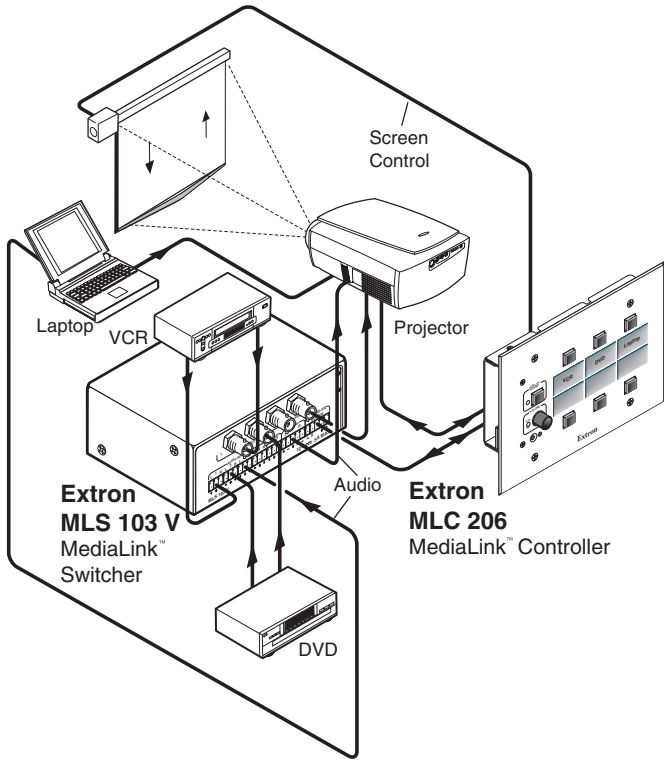
NOTE *For dBV the reference is 1 volt. For dBu the reference is 0.775 volts.*

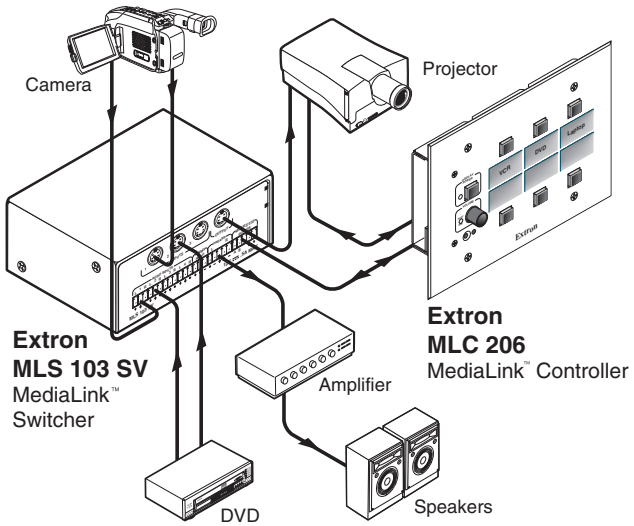
5. In the control program, move the Audio Input Level slider to select the gain/attenuation for that input, as shown at left.

6. Repeat steps 3–5 for the other three inputs.
7. Test the system by listening to audio output for each input. Start by setting the audio output set to the lowest level.
   - **7a.** If the audio output is too loud or is clipping (becoming distorted as the loudest parts are cut off), decrease the gain for that input.
   - **7b.** If the output is too soft or inaudible, increase the gain.

Application Diagrams







Chapter Three

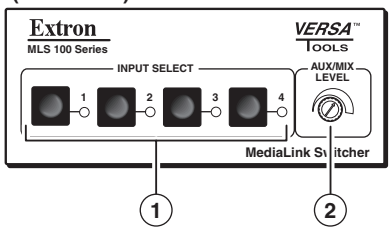
Operation

Front Panel Features and Operation

Troubleshooting

Front Panel Features and Operation

MLS 100 Series Front Panel (all models)



All the MLS 100 Series switchers share the same front panel design, shown above.

(1) **Input selection buttons and indicator LEDs** — Press one of these buttons to select the desired audio and video input. The corresponding LED lights and remains lit while an audio-video input is selected. During audio breakaway (selectable only via RS-232 control, described in chapter four), audio is switched separately from video; the selected video input's LED lights steadily, and the audio input's LED blinks.

- The **MLS 100 A** accepts only audio inputs, so pressing one of these buttons selects an audio-only input.
- The **MLS 103 V** and **MLS 103 SV** offer three video inputs and four selectable audio inputs. Pressing button 1, 2, or 3 selects audio-video input 1, 2, or 3; pressing button 4 selects audio-only input 4.
- The **MLS 102 VGA** offers two computer-video inputs and four selectable audio inputs. Pressing button 1 or button 2 selects audio-video input 1 or 2; pressing button 3 or button 4 selects an audio-only input (3 or 4) .

If you select an audio-only input (input 3 or 4 for MLS 102 VGA, input 4 for MLS 103 SV and MLS 103 V) via front panel buttons, the video signal is muted, and the selected audio input's LED blinks.

Input 0 can be selected via RS-232 control only by using an SIS command or by selecting Mute (shown here) from the User Mode section of the control program (if the MLS is used without an MLC). Selecting input 0 mutes the audio from inputs 1 through 4.

For all models the **Aux/Mix audio input** is always enabled and cannot be turned on or off from the front panel. The Aux/Mix audio does not change when you switch between the four selectable audio inputs.

The last selected input (including audio/video breakaway selections) will be the active input when the MLS is powered on.

(2) **Aux/Mix Level control** — This potentiometer controls the auxiliary/mix audio volume. This channel's audio is always output, no matter which, if any, other audio input (0, 1, 2, 3, 4) is selected. Use a small screwdriver to turn this control while you listen to the audio output. When the control is turned to its counterclockwise limit (-43 dB), the Aux/Mix signal will be inaudible. You will hear the maximum Aux/Mix volume when the control is turned to the clockwise limit (+24 dB).

NOTE *Once this level is set, the Aux/Mix level remains the same no matter which input (1 through 4) is selected, and the Aux/Mix audio can be heard at that level even if the selectable audio inputs are muted or if audio input 0 is selected via RS-232 control.*

NOTE *The gain and attenuation **for audio inputs 1 through 4** is adjustable only via RS-232 control (using a third party controller, a MediaLink Controller, or the MediaLink Control Software.)*
*The gain and attenuation **for the Aux/Mix input** is adjustable only via the Aux/Mix Level control.*

Executive mode — enabling and disabling front panel buttons

1. To disable front panel input selection (turn executive mode on), simultaneously press input selection buttons 1 and 4 and hold them down for three seconds. All LEDs will light for about one second.
2. While executive mode is on, input selection can be performed via RS-232 control or from an optional MediaLink Controller.
3. To enable front panel input selection (turn executive mode off), repeat step 1 (pressing and holding buttons 1 and 4).

Troubleshooting

1. Connect the cables between the MLS and the A/V input devices. Connect the provided power supply and a host computer, third party control system, or MediaLink Controller to the MLS's MLC/RS-232 Power port. Connect the MLS to the display device (projector) and audio output device (tape deck, speakers).
2. Connect the control device (computer, control system, or MLC 206), the A/V source devices, projector and audio output device to a power source and turn them on.
3. Start the *MediaLink Control Program*, and set up the MLS (and the MLC, if one is used). See chapter four.

NOTE *To set up the MLS 100 Series switcher you must use* **MediaLink Control Software *version 2.0 or higher***. *See the second note on page 2-9. If the software version is below 2.0, download a new version of the software from the Extron Web site,* www.extron.com.

4. Press an input button on the MLS, watch the MLS's LEDs, observe the display, and listen to the audio.

   4a. If the input selection LED does not light when a button is pressed, the MLS might not be receiving power. Check the wiring at the MLS's MLC/RS-232 Power port.

   - If the conductor assignments are not correct, the circuits may be damaged if power is applied to the wrong pole.
   - If the wiring is correct, ensure that the power supply has been plugged in to a functional power source.

   4b. If power is present at the MLS and at the input and output devices, **but nothing happens** (an A/V switch is not detected) when a button is pressed:

   - If a MediaLink Controller is part of the system, the MLC's firmware may be too old. If it is older than version 1.04, contact Extron for a firmware upgrade.

NOTE *The MLC to which the MLS 100 Series switcher is connected* ***must*** *have* ***MLC firmware version 1.04 or higher***. *Use one of the following methods to find out the version levels of the MLC's firmware and the control software.*

- *Connect the MLC's RS-232 port to a computer or RS-232 controller, and send an SIS command of* Q *to the MLC. The MLC will respond with its firmware version.*
- *Connect the MLC's RS-232 port to a computer, start the MediaLink control software, and click on* Help *to display the software version, the MLC's firmware version, and the MLS's firmware version.*

   - The audio settings may be too low. Adjust the Aux/Mix level by turning the Aux/Mix Level adjustment on the front panel. Adjust each selectable input's level by using SIS commands, a control system, or the *Switcher (MLS) Config.* part of the MediaLink Control Software.
   - The input or output connectors may not be firmly attached to the MLS, or they may be miswired.

   4b. If power is present, but sound from inputs 1 through 4 isn't audible, and if changing the audio volume and gain/attenuation settings does not resolve the problem, make sure that neither audio input 0 nor audio mute is selected. Use the SIS information (I) command or the MediaLink Control Program to determine the audio settings.

5. Call the Extron S^3 Sales and Technical Support Hotline if the equipment still does not respond when the MLS's buttons are pressed.

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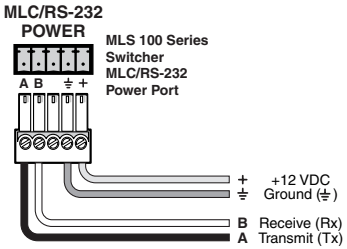
Chapter 4

Serial Communication

RS-232 Programmer's Guide

Control Software for Windows

The MediaLink switcher can be remotely set up and controlled via a host computer or other device (such as a control system) attached to the rear panel MLC/RS-232 Power port. Alternatively, the switcher can be controlled by an optional MediaLink Controller (MLC) (connected to the MLS's MLC/RS-232 Power port) or by an RS-232 device acting through the MLC. The control device (host) can use either the Extron Simple Instruction Set (SIS™) commands or the graphical control program for Windows®. For details on use and setup of a system that includes a MediaLink Controller, see the *MediaLink Controllers User's Manual*.



The switcher protocol is
9600 baud
1 stop bit
no parity
no flow control.

The MLC/RS-232 Power 3.5 mm, 5-pole captive screw connector's pin assignments are shown at left.

MLC/RS-232 Power port pin assignments

RS-232 Programmer's Guide

Host-to-MLS communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the MLS determines that a command is valid, it executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

MLS-initiated messages

When a local event such as a front panel selection or adjustment takes place, the MLS responds by sending a message to the host. No response is required from the host. The MLS-initiated messages are listed here (underlined).

(c)Copyright 2002, Extron Electronics MLS 100 Series, V0.08 ↵
The MLS sends the copyright message when it first powers on. Vx.xx is the firmware version number. The MLS 102 VGA is used in this example.

Chn[X1] ↵ (where [X1] is the input number)
The MLS sends this response when an input is switched.

Error responses

When the MLS receives a valid SIS command, it executes the command and sends a response to the host device. If the MLS is unable to execute the command because the command is invalid or it contains invalid parameters, it returns an error response to the host. Error response codes and their descriptions are as follows:

E01 – Invalid input channel number (the number is too large)
E10 – Invalid command
E13 – Invalid value (the number is out of range/too large)
E14 – Invalid for this configuration.

Using the command/response tables

The command/response tables on the next page list valid command ASCII codes, the MLS's responses to the host, and a description of the command's function or the results of executing the command. Unless otherwise indicated (as for the gain commands), upper and lower case characters may be used interchangeably in the command field.

ASCII to HEX Conversion Table

	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

The ASCII to HEX conversion table at left is for use with the command/response tables.

ASCII to Hex conversion table

Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

• = Space

[Esc] = Escape key

[X1] = Specific input number
(0 – 4 maximum)
0 = no connection
1 = input 1 & Aux/Mix
2 = input 2 & Aux/Mix
3 = input 3 & Aux/Mix
4 = input 4 (audio only) & Aux/Mix

[X2] = Audio gain (per input)
0 to 24; 0 dB through +24 dB in 1 dB steps

[X3] = Audio attenuation (per input)
0 to 18; 0dB through -18 dB in 1 dB steps)

[X4] = Input to be adjusted (1 – 4)
1 = input 1
2 = input 2
3 = input 3
4 = input 4

[X5] = Audio gain/attenuation value (-18 through +24)

[X6] = Volume adjustment range: 0% (90 dB attenuation) to 100% (0 dB attenuation). Adjustment increments are 1 dB for steps from 1% to 40% volume. Adjustments are in 0.5 dB increments from 41% to 100% volume.

[X7] = On/off status
0 = off/disable
1 = on/enable

[X8] = Switcher firmware version (listed to two decimal places e.g.: x.xx)

Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Input selection			
Select an input (audio and video).	X1 !	Chn X1 ↵	Select input X1 (audio and video).
Example:	4!	Chn4↵	*Example*: select input 4.
Select an audio input.	X1 $	Aud X1 ↵	Select input X1 audio only.
Select a video input.	X1 &	Vid X1 ↵	Select input X1 video only.
Audio input gain/attenuation (per input)			
Set a specific input's audio gain.	X4*X2 G	InX4 Aud=X5 ↵	Set a single input's gain (in dB).
Example:	3*9G	In4 Aud=+09↵	*Example*: set input 3's gain to +9dB.
Set a specific input's audio attenuation.		X4*X3 g	InX4 Aud=X5 ↵ Set an input's attenuation (in dB).
Increment a specific input's gain.	X4*+G	InX4 Aud=X5 ↵	Increase an input's gain by 1 dB.
Decrement a specific input's gain.	X4*-G	InX4 Aud=X5 ↵	Decrease an input's gain by 1 dB.
View a specific input's audio gain level.		X4*G	InX4 Aud=X5 ↵ Show an input's audio level.
Set current input's audio gain.	X2 G	InX4 Aud=X5 ↵	Set the current input's gain (in dB).
Set current input's audio attenuation.	X3 g	InX4 Aud=X5 ↵	Set attenuation (in dB).
Increment current input's gain.	+G	InX4 Aud=X5 ↵	Increase the gain by 1 dB.
Decrement current input's gain.	-G	InX4 Aud=X5 ↵	Decrease the gain by 1 dB.
View current input's audio gain level.	G	InX4 Aud=X5 ↵	Show the audio level.
Audio mute (overall)			
Mute on	1Z	Amt1↵	Mute all audio outputs.
Mute off	0Z	Amt0↵	Unmute all audio outputs.
View the audio mute status.	Z	Amt X7 ↵	Show the status of audio mute.

Volume adjustment (overall)			
Set the overall output volume.	X6 V	Vol X6 ↵	Specify the volume for the audio output.
Example:	13V	Vol013 ↵	*Example*: set volume to 13.
Increment the volume.	+V	Vol X6 ↵	Increase audio output.
Decrement the volume.	-V	Vol X6 ↵	Decrease audio output.
View the volume level.	V	Vol X6 ↵	Show the output volume.
Executive mode			
Turn executive mode off.	0X	Exe0 ↵	Enable front panel operation. Adjustments and selections can be made from the front panel.
Turn executive mode on.	1X	Exe1 ↵	Lock front panel adjustments; make changes by RS-232 only. Only input selection and volume adjustment are available via the front panel.
View the executive mode status.	X	Exe X7 ↵	Show executive mode status.
Example:	X	Exe0↵	
Firmware version, part number & information requests			
Query firmware version number.	Q	Ver X8 ↵	Show the switcher's firmware version.
Request the part number.	N	N60-497-0X↵	Show the MLS's part #.
Request general info.	I	(see below)	Show the MLS's status.
Zap (reset to default settings)			
Zap all MLS settings/memories.	Esc zXXX	ZapXXX ↵	Reset everything (all settings and adjustments) to the factory default.

Vid X1 • Aud X1 • Vol X6 ↵

Video input #X1 is selected/active.

Audio input #X1 is selected/active.

Audio volume level is X6.

Command/response table for special function SIS commands

The syntax for setting a special function is __ * [X?] # where __ is the function number and [X?] is the value.

Command/response table for special function SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	[X?] values and additional descriptions
Delay times			
Set the RGB delay.	3 * [X?] #	RGBDly* [X?] ↵	0 = 0.0 seconds (default), 1 = 0.5 seconds, 2 = 1.0 seconds, ... in ½ second steps up to 10 = 5.0 seconds
Example:	3*7#	RGBDly*07 ↵	*Example:* 3.5 second RGB delay.

To view a function's setting, use __#, where __ is the function number. In the table at left the values of the [X?] variable are different for each command/function. These values are given in the rightmost column.

Control Software for Windows®

The included Extron MediaLink Control Program for Windows offers another way to control the switcher via RS-232 connection in addition to the Simple Instruction Set commands. The control program's graphical interface includes input selection functions and some additional features that are only available through the software.

NOTE *To set up the MLS 100 Series switcher you must use* **MediaLink Control Software** ***version 2.0 or higher***.

The control software is compatible with Windows 95/98, Windows NT, and Windows 2000. Extron's MediaLink Control Program is included with the MLS, and updates can be downloaded from the Extron Web site (http://www.extron.com).

Installing the software

The control program is contained on a set of 3.5-inch diskettes; it requires approximately 2 MB (megabytes) of hard disk space.

To install the software on the hard drive:

1. Run SETUP.EXE from the floppy disk.
2. Follow the instructions that appear on the screen.

   By default the installation creates a C:\MediaLnk directory, and it places two icons (MediaLnk Control Pgm and MediaLnk Help) into a group or folder named "Extron Electronics".

Using the control program

The MediaLink Help Program provides information on settings and on how to use the control program itself. Some features are only available via this control program. These features are described in the sections of this chapter that correspond to the parts of the control program where the features are found.

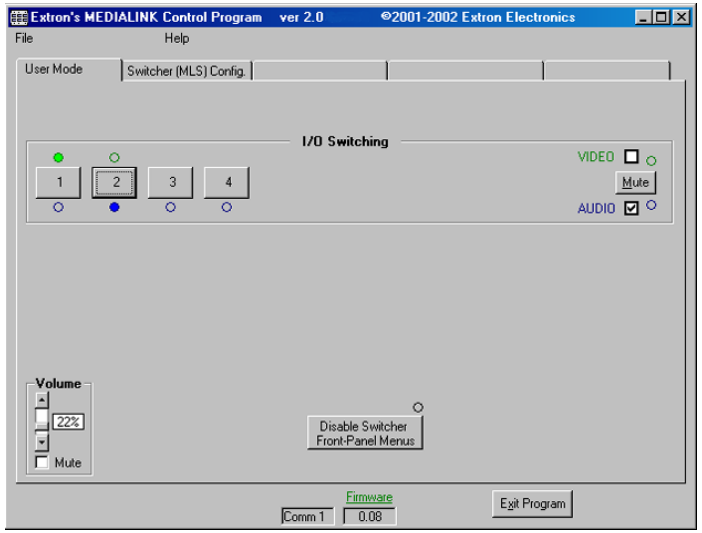
1. To run the control program, double-click on the MediaLnk Control Pgm icon in the Extron Electronics group or folder. The Comm Port Selection menu appears on the screen.

2. Click on the comm port that is connected to the MLS's RS-232 port. The Extron MediaLink Control Program windows appear. The port and firmware information are displayed at the bottom of the screen. There are two views available: the *User Mode* screen, and the *Switcher (MLS) Configuration* screen.

User Mode

For stand-alone MLS 100 Series switchers

If an MLS 100 Series switcher is used *without* a MediaLink Controller, the *User Mode* screen, shown below, emulates the MLS's front panel input selection buttons and also provides a means of volume control. See page 3-2 for details on basic operation.



Special features

Audio/video breakaway switching — To switch the audio signal separately from the video signal, check the Audio checkbox (at the right side of the I/O Switching area) and uncheck the Video checkbox, then select an input. The MLS switches to that input's audio and leaves the previously selected video source active. Audio breakaway is shown above: the video is from input 1 and the audio is from input 2. (The corresponding SIS command is *1&2$*.)

To switch the video signal without changing the audio source, check the Video check box and uncheck the Audio checkbox. See the picture at left.

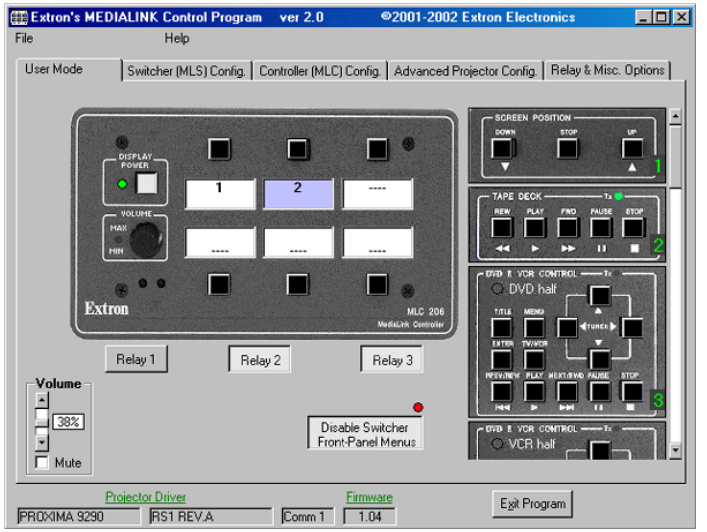
Selecting Mute selects input 0 (no input).

Volume Mute — Check this box (in the lower left corner) to activate the audio mute (Amt) command. See page 4-4 for the corresponding SIS command.

Disable Switcher Front Panel Menus — This feature (near the bottom of the screen) toggles the executive mode on or off to prevent or enable making changes (input selections) via the MLS's front panel.

For MLS 100 Series switchers controlled by an MLC

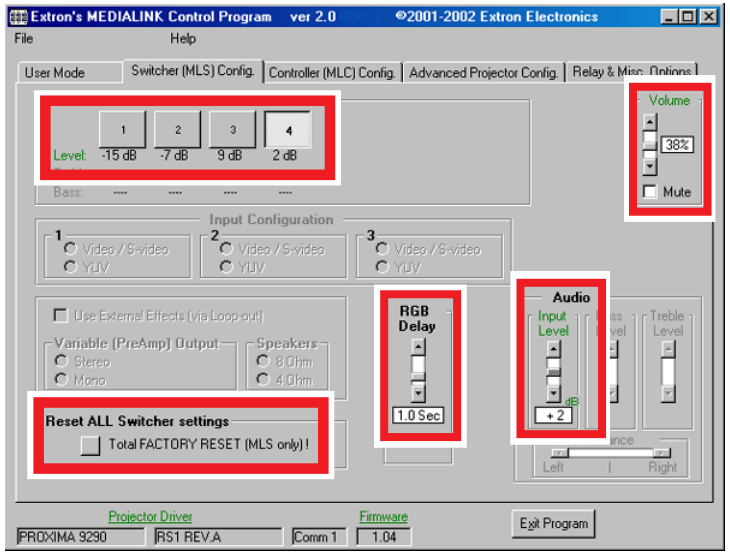
If the MLS 100 Series switcher is connected to and controlled by an MLC, the user mode screen will look something like what is shown in the picture below.



In this case, you must set the volume control in the *Controller (MLC) Config* section to "Switcher", as shown at right.

Switcher (MLS) Config

The *Switcher (MLS) Config* screen, shown below, allows you to make adjustments without having to use the front panel controls.



In this part of the program you can:

- Set the per-input audio gain or attenuation.
- Set overall volume; this is the same as the *User Mode* volume adjustment.
- Set the RGB delay period (MLS 102 VGA model only).
- Reset the switcher to factory default settings.

Saving and restoring configurations

The MLS can be configured via RS-232 communication, and the configuration settings can be saved to a file for later use.

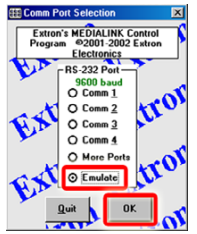
1. In the MediaLink Control Program, select **File**, then select **Save Configuration as...** .
2. Save the file as *filename*.MLK. An unlimited number of configuration files can be saved as long as each file has a unique file name ending in .MLK.
3. To retrieve the configuration from within the MediaLink Control Program, select **File**, then select **Restore Configuration from...** . A set of all the switcher and audio adjustment settings will be downloaded into the MLS.

Emulation mode

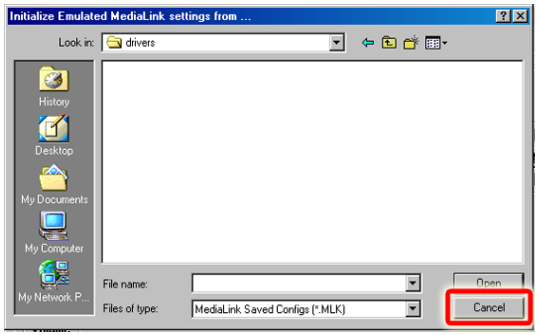
The MediaLink Control Program features an emulation mode so you can set up a MediaLink system before equipment is available on site. In emulation mode a MediaLink Controller is always included in the system. You select which MLS switcher and which control modules will be connected to the MLC. For a stand-alone MLS (without an MLC), connect the MLS directly to the host computer for setup rather than using emulation mode.

You can save the emulated settings to a configuration file, then load that configuration file to the switcher (or switcher and MLC) when equipment is available.

1. Start the control program by double-clicking on the MediaLnk Control Pgm icon in the Extron Electronics group or folder. The Comm Port Selection screen (shown at right) appears.

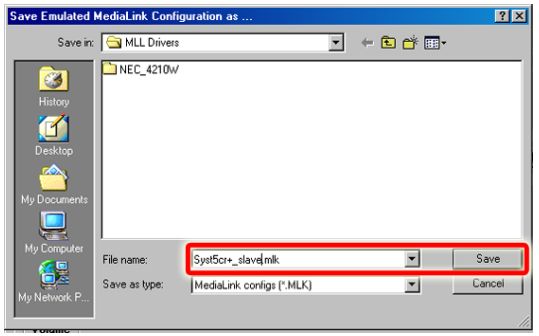


2. Click on the **Emulate** radio button, then click on OK. The *Initialize Emulated MediaLink Configuration from...* dialog box appears.
3. Because you will be creating a brand new configuration, select **Cancel** instead of selecting a driver file.

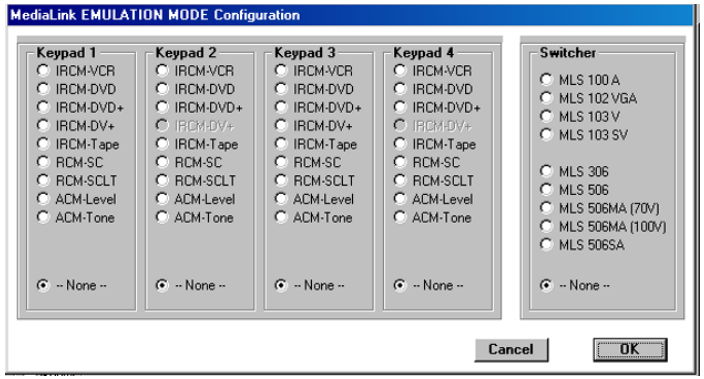


The *Save Emulated MediaLink Configuration as...* dialog box appears.

4. Enter a filename of your choice for storing the configuration settings, then select **Save**.



The *Emulation Configuration* dialog box appears.



5. Select the MediaLink equipment that will be part of the system you want to configure, then click on **OK**. The Extron MediaLink Control Program windows appear.
6. Select the desired settings in each section of the program.

NOTE *If you include an MLC 206 in the system, keep in mind that IR learning cannot be performed in emulation mode. You must have an MLC connected to the host computer.*

7. To save the configuration for future use, follow steps 1 and 2 on page 4-10.

Updating firmware

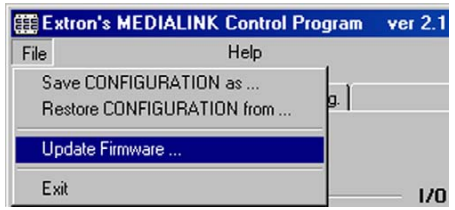
If the need arises, you can replace the MLS's firmware without opening the unit or changing firmware chips. Follow the directions below.

This procedure must be performed using a PC on which the MediaLink Control Software (version 2.4 or higher) has been installed, and the PC's RS-232 port must be directly cabled to the MLS's MLC/RS-232 Power port.

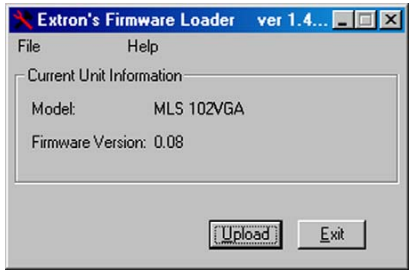
CAUTION *Do not attempt to upload firmware if a MediaLink Controller (MLC) or other control system is connected to the MLS switcher. The RS-232 cable from the PC must be connected directly to the MLS.*

NOTE *Each time you replace existing firmware, the switcher will be reset to the factory default settings.*

1. Visit the Extron Web site (www.extron.com) to find the appropriate firmware file for the model of switcher you want to update. Save the new firmware file, and write down the filename and location for later use.
2. Connect a cable between the MLC/RS-232 Power port of the MLS and the serial (RS-232) port of the PC (see chapter two), and power on the MLS.
3. Start the MediaLink Control/Configuration program.
4. From the File pulldown menu in the upper left corner, select **Update Firmware**.



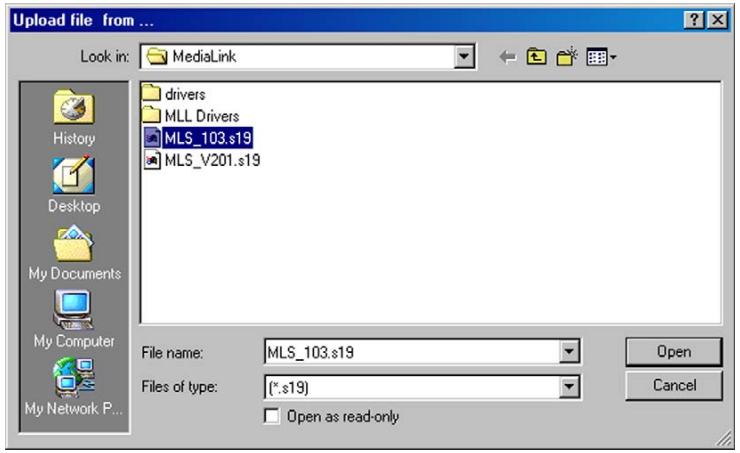
The MediaLink Control Software closes, and a separate utility program opens and displays a window indicating the current firmware version.



5. Click on **Upload**. You will be prompted to select the firmware file that you downloaded in step 1. Click on **OK**.

6. When the browser window opens, locate and select the firmware file, then click on Open to upload the firmware into the MLS.

NOTE *The firmware update file must have a filename extension of* ***.s19****. If the file does not have that extension, it will not work properly.*

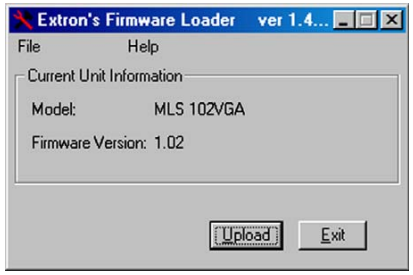


7. Follow the on-screen instructions.

NOTE *When you recycle power, power off the switcher for at least four seconds, then restore power.*

8. When the firmware uploading is complete, a dialog box appears and asks you

   - **to exit the firmware update utility program** if the new firmware loaded correctly (if the correct firmware version is displayed in the program window, as shown in the example below)



   or

   - **to run the utility again** (Upload Firmware File, see step **5**) if the firmware didn't load correctly.

   Follow the on-screen directions to complete the process.

Using the help program

For information on program features, press the F1 computer key, or click on the Help menu within the MediaLink control program, or double-click on the MediaLnk Help icon in the Extron Electronics group or folder.

For explanations of buttons or functions, click on the tabs in the help screen to reach the desired screen. Use a mouse or the Tab and Enter keys to select a button/function. A description and tips on using the program will appear on screen.

Key to file names

File name	Description
_____.**MLK** —	User-saved MLC/MLC-MLS/MLS configuration file. This includes adjustments/settings. If the MLS is connected to an MLC 206, the file will also contain whatever driver (if any) was installed in the MLC 206 at the time the file was saved. See the *MediaLink Controllers User's Manual* for details.
_____.**s19** —	This is an Extron-supplied firmware update file. When the firmware is replaced, the switcher is also automatically reset to factory default settings.

Appendix A

Specifications, Part Numbers, and Accessories

Specifications

Included Parts

Accessories

Cables

Adapters

MLS 100 Series Switcher Block Diagram

Specifications, Part Numbers, and Accessories

Specifications

Video — MLS 103 V/SV, MLS 102 VGA

Gain	Unity
Bandwidth	250 MHz (-3 dB)
Differential phase error	0.01°, at 3.58 MHz and 4.43 MHz
Differential gain error	0.01%, at 3.58 MHz and 4.43 MHz
Crosstalk	-50 dB @ 5 MHz

Video input — MLS 103 V/SV, MLS 102 VGA

Number/signal type	
MLS 103 V	3 composite video
MLS 103 SV	3 S-video
MLS 102 VGA	2 VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs
Connectors	
MLS 103 V	3 female BNC
MLS 103 SV	3 female 4-pin mini DIN
MLS 102 VGA	2 female 15-pin HD
Nominal level	
MLS 103 V	1 Vp-p for composite video
MLS 103 SV	1 Vp-p for Y of S-video 0.3 Vp-p for C of S-video
MLS 102 VGA	0.7 Vp-p for RGB
Minimum/maximum levels	0.3 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 150 kHz
Vertical frequency	30 Hz to 150 Hz
Return loss	<-45 dB @ 5 MHz
DC offset (max. allowable)	1.5 V

Video output — MLS 103 V/SV, MLS 102 VGA

Number/signal type	
MLS 103 V	1 composite video
MLS 103 SV	1 S-video
MLS 102 VGA	1 VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs
Connectors	
MLS 103 V	1 female BNC
MLS 103 SV	1 female 4-pin mini DIN
MLS 102 VGA	1 female 15-pin HD

Nominal level	
MLS 103 V	1 Vp-p for composite video
MLS 103 SV	1 Vp-p for Y of S-video 0.3 Vp-p for C of S-video
MLS 102 VGA	0.7 Vp-p for RGB
Minimum/maximum levels	0.3 V to 2.0 Vp-p
Impedance	75 ohms
Return loss	-38 dB @ 5 MHz
DC offset	±5 mV maximum with input at 0 offset

Sync — MLS 103 V/SV, MLS 102 VGA

Input type (MLS 102 VGA)	RGBHV, RGBS, RGsB, RsGsBs
Output type (MLS 102 VGA)	RGBHV, RGBS, RGsB, RsGsBs (follows input)
Standards (MLS 103 V/SV)	TTL (RGB), NTSC 3.58, NTSC 4.43, PAL, SECAM
Input level	0.5 V to 5.0 Vp-p
Output level	0.5 V to 5.0 Vp-p, unterminated
Input impedance	75 ohms
Output impedance	75 ohms
Max input voltage	5.0 Vp-p
Max. propagation delay	30 ns
Polarity	Positive or negative (follows input)

Audio

Gain	Unbalanced output: -6 dB; balanced output: 0 dB (unity)
Frequency response	20 Hz to 20 kHz, ±0.5 dB
THD + Noise	<0.5% @ 1 kHz at nominal level
S/N	>90 dB @ 20 Hz to 20 kHz
Crosstalk	<-65 dB @ 20 Hz to 20 kHz, <-80 dB @ 1 kHz and below 60 Hz, fully loaded
Stereo channel separation	>72 dB @ 20 Hz to 20 kHz
CMRR	>75 dB @ 20 Hz to 20 kHz

Audio input

Number/signal type	4 stereo/mono, unbalanced (switchable) 1 mono, balanced/unbalanced aux-mix (always active, non-switchable)

Connectors	
MLS 100 A, MLS 103 V/SV	(5) 3.5 mm captive screw connectors, 3 pole
MLS 102 VGA	2 mini stereo jacks (female tip-ring-sleeve connectors) (3) 3.5 mm captive screw connectors, 3 pole
Impedance	>10k ohms unbalanced, >20k ohms balanced, DC coupled
Nominal level	-20 dBV (100 mV), -10 dBV (316 mV), 0 dBu (0.775 V), or +4 dBu (1.23 V); (configurable)

NOTE *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu*
+4 dBu and 0 dBu are professional audio line level standards.
-10 dBV and -20 dBV are semiprofessional, computer audio, and consumer audio standards.

Maximum level	+14 dBu, (balanced or unbalanced) at stated %THD+N
Input gain adjustment	–18 dB to +24 dB, adjustable per input (via RS-232/control software)
Aux/Mix level adjustment	-43 dB to +24 dB (adjustable only via front panel)

Audio output

Number/signal type	1 stereo or mono, balanced/unbalanced
Connectors	(1) 3.5 mm captive screw connector, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+21 dBu, balanced or unbalanced at 1% THD+N
Maximum level (600 ohm)	>+15 dBm, balanced or unbalanced at 1% THD+N

NOTE *An unbalanced-wired output will result in a 6 dB attenuation. A balanced-wired output will have unity (0 dB) gain/ attenuation.*

Control/remote — switcher

Serial control port	RS-232, 3.5 mm, 5 pole captive screw connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	A = TX, B = RX, D = GND
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

General

Power	Supplied by an optional MediaLink Controller (MLC) or an external power supply
External power supply (included)	100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 1 A max., regulated
Power input requirements	12 VDC, 0.4 A
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, noncondensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, noncondensing
Rack mount	Yes, with optional VersaTools® rack shelf, part #60-190-20; or standard 1U rack shelf, #60-190-01 Furniture mountable with optional mini under-desk brackets, part #70-212-01 Projector mountable with optional bracket, part #70-217-01
Enclosure type	Metal
Enclosure dimensions	1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide) 4.2 cm H x 11.0 cm W x 7.6 cm D (Depth excludes connectors and buttons.)
Product weight	0.7 lbs (0.3 kg)
Shipping weight	3 lbs (2 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Included Parts

These items are included in each order for an MLS switcher:

Included parts	Part number to reorder
MLS 100 A	60-497-01
or MLS 103 V	60-497-02
or MLS 103 SV	60-497-03
or MLS 102 VGA	60-497-04
12 VDC, 1 A external power supply	
USA domestic version	70-055-01
World version	70-055-02
IEC power cord	
Tweeker (small screwdriver)	
Rubber feet	
3.5 mm, 3-pole captive screw connectors	10-319-13
3.5 mm, 5-pole captive screw connectors	10-319-10
MLS 100 Series User's Manual	
MediaLink Control Software	

Accessories

These items can be ordered separately

Accessories	Part number
VersaTools® 1U rack shelf	60-190-20, 60-604-20
or Standard 1U rack shelf	60-190-01, 60-604-01
or Mini under-desk mounting bracket kit	70-212-01
or Mini projector mounting kit	70-217-01
MediaLink Controller MLC 206 (3-gang) (gray, black, white)	60-385-01, -02, -03
P/S 100 power supply	60-357-01

Cables

Plenum Comm-link cable	Part number
50 feet, 100 feet, 200 feet	26-461-01, -02, -03
300 feet, 400 feet	26-461-05, -04

Conductor gauges in Extron Comm-Link cables	
red & black single strands (for power/ground)	18 AWG
white & violet shielded single strands (for signals)	22 AWG
drain wire	24 AWG

Adapters

Adapters	Part number
SVHSM-BNCF S-video male to BNC female adapter (for MLS 103 SV)	26-353-01

MLS 100 Series Switcher Block Diagram